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STANDARDIZATION IN AFRICA

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I. INTRODUCTION

1. The Standing Committee on Industry, Natural Resources and Transport of the Economic Commission for Africa at its second session, held in Addis Ababa in December 1963, recommended that the secretariat should undertake a study on standardization in Africa on a national, sub-regional and regional basis. The recommendation was endorsed by the Economic Commission for Africa at its sixth and seventh sessions, in February 1964 and February 1965, respectively. The text of the recommendation reads as follows:

Co-ordination of standardization in Africa [1]

Several delegates drew attention to the need to co-ordinate standardization in Africa, in particular the main standards applicable to energy, transport, basic materials, manufactured goods, machinery and equipment. It was agreed that the benefits of such co-ordination would be felt at several levels:

(a) with respect to imports, in order to enable the African countries to open their markets in free competition to goods from the whole world, while offering an adequate outlet to goods manufactured in conformity with African standards;

(b) with respect to exports, in order to guarantee the quality of African raw materials or manufactured goods which will have to stand up to international competition;

(c) with respect to inter-African trade, in order to facilitate the inter-changeability of African products and the co-ordination of investment policies in transport, energy, heavy and light industry, etc.;

(d) with respect to domestic markets, in order to improve the quality of national production and facilitate its development.

1/ Report of the Standing Committee on Industry, Natural Resources and Transport on its Second Session (E/CN.14/245/Corr.1, E/CN.14/INR/54/Corr.1) p. 13 and 14.

The Committee requested the Executive Secretary to undertake a preliminary study describing the present situation in the field of national standardization and the work already achieved or envisaged by African institutes for standardization, reviewing the experience of other regions and suggesting a suitable order of priorities and a phased programme of work in close collaboration with the governments and interested international organizations. It was further requested that a priority list of products to be standardized should be drawn up, such products corresponding to the requirements of accelerated industrialization in Africa. In this connexion it was stressed that standardization should not mean discouragement of new industries in Africa but should contribute to the industrialization effort, inter alia by facilitating the importation of capital equipment.

2. A small team of experts - Mr. Dag Du Rietz, Consulting Engineer, Sweden; Mr. C. Kuilman, General Secretary of the Netherlands Standards Institution; Mr. S. Janicki, Head, Building Section, Polish Standard Committee; and Mr. J. Lambert, Regional Adviser on Industrial Development, UNECA - visited a number of countries in East, West, Central and North Africa during the period March-June 1965. The terms of reference of the team were derived from the recommendations referred to above, and are summarized below.

3. (a) Investigation of the extent to which standardization has already been introduced in the African region, specifying the countries where such a programme was already underway;

(b) Identification of fields in which standardization has been initiated and the type of machinery established;

(c) Examination of the type of machinery which would be appropriate in Africa for promoting and developing the application of standardization on a country, sub-regional and regional basis.

II. USEFULNESS OF STANDARDIZATION

4. Standardization is not new. It has existed through the ages in some form or other. Its first manifestations may be found in the norms introduced in language, writing, measures of length, weight and volume, and currency.

5. While the spontaneous application of standardization goes back to the earliest times the modern phase of standardization [1] began with the factory system; as the scale of production increased, lack of dimensional interchangeability in industrial products resulted in unnecessary wastage and confusion. Standards and co-ordination between industries reduce unnecessary variety and ensure changeability. Deliberate reduction in the variety of products, whether materials, intermediate components and parts, or end-products, results in over-all savings which benefit industry, trade and the consumer.

6. Several [2] standards institutes were established in industrialized countries just prior to the First World War. By 1918 the importance of standardization as an industrial process for ensuring interchangeability within a given factory unit and between factories was widely recognized. The oldest national standards institute is the British Standards Institution which was established in 1901; and its American counterpart, the American Standards Association, in 1918.

7. Also, an international standardization movement began to develop early in the twentieth century. The International Organization for Standardization (ISO) was founded in 1946 and the International Electrotechnical Commission (IEC) was established in 1906.

8. While universal standards may be useful, it is essential for the African countries to evolve their own independent standards that are suited to their special requirements.

1/ Lal. C. Verman "Standardization in a Developing Economy" Industrialization and Productivity, United Nations Bulletin, pp. 37-51.

2/ Lal. C. Verman, op. cit. pp. 38-39.

9. In the developing countries of Africa, where industrial development is often dependent on outside assistance which is usually provided by different industrial groups in different countries, the standards used are generally borrowed from developed countries. Thus, production units tend to adopt [1/] and follow the pattern of standardization of different industrialized countries. This creates certain difficulties. First, outside standards may be inadequate for the intended purpose or unsuitable.

10. In general, every item for standardization presents its own special problems which have to be individually examined and solved in the light of the special conditions obtained in each country or sub-region. Secondly, there are many cases in which no national, sub-regional or overseas standards exist. Thirdly, the importation of know-how and equipment from different parts of the world results in thousands of different types of products and standards, and many lead to waste and confusion. They may also prevent or delay industrial development in Africa where the majority of countries are relatively small, the limited demand for each type of product in the same branch of industry makes it difficult, if not impossible, to develop indigenous production.

11. Countries already possessing national standards have tended to develop independently of one another. This has resulted in what is described as "technical customs barriers"; obstacles to the circulation of products due, not to duties or quotas, but to the fact that products intended for a particular market do not meet the technical requirements of markets in neighbouring countries.

12. For all these reasons it is necessary for African countries to develop their own national, sub-regional and continental standards. These would help industrial development from the earliest stage of planning, design of projects, through erection, production and distribution. The planned development of industry will be considerably

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1/ Lal. C. Verman, op. cit., pp. 39-40.

assisted if standardization is also planned from the beginning. Standardization plays a crucial role in exports and in ensuring reasonably satisfactory prices. It is also essential for conservation of scarce available resources and for attaining a high level of productivity, all of which are important requirements for orderly economic development.

III. BASIC CONCEPTS AND AIMS OF STANDARDIZATION

13. As it will be noted from the discussion in the preceding chapter the aims of standardization are to achieve:

(a) over-all economy [1];

(b) protection of consumers;

(c) safety and protection of health and life.

14. Over-all economy of scarce resources: human effort, materials and machines, power and energy, creates maximum productivity. The pursuit of over-all economy also results in simplification and reduction of a variety of products and components. It eliminates wastage during handling of materials, processing, transport and in general, exchange of goods.

15. Protection of consumer interest is ensured through adequate and consistent quality of goods and services. Quality of service is not limited only to material services such as the attainment of higher quality or performance or functional interchangeability of consumer articles, but also to non-material services and conveniences such as standard and ready availability of standard goods from stock, the simplicity coupled with serviceability of consumer equipment.

16. Provision for safety and protection of health and life is an essential element of those standards where safety requirements might arise. It may concern goods in general use or materials or processing during production. Examples are standards for limiting impurities in food stuff, standards for storage of radio-active materials, regulations for earthing of electrical wiring and equipment, etc.

17. These are pre-requisite aims to establish order in industry, trade and commerce, and in human relationships generally. They help to regulate the conduct of commerce and trade in a smooth and efficient manner and assist in improving productivity of man and machines.

1/ Lal. C. Verman, op. cit., p. 42.

These constitute an important contribution to the solution of major economic problems, which affect all countries, but are particularly urgent and crucial for the developing countries. National and international standards are, in fact, both sources of technical information, bearing on their practical applications and a means of administrative action as a factor influencing economic policy.

18. The formulation of a standard often shows the need for research and stimulates it. Differences in design and material specifications may largely be due to a lack of knowledge of properties and performance. Well-planned research can determine whether this is so, but only if results are incorporated in published standards can the widest application of such knowledge take place. Standards and research are the twin supports of industrial progress.

19. Standardization may be either functional or dimensional. Functional standardization includes all standards dealing with "fitness for the purpose". This may deal with quality, methods of test, methods of use, terms and definitions, quality measures fitness for the purpose through performance or composition. Methods of test establish uniformity in methods of measurement, and test, thereby facilitating comparison of results and diminishing chances of dispute. Such standards encourage a more general adoption of testing by industry. Methods of use specify correct appliances. These standards cover the methods of installation and are designed to diminish chances of accident. Terms and symbols constitute the alphabets of industry and these should be clearly defined in order to secure accuracy of description.

20. Dimensional standards achieve:

(a) simplification;

(b) unification - and typification;

(c) interchangeability.

As already stated, if unnecessary multiplication of articles and appliances can be avoided, the processes of manufacture and the re-

placement of parts will be simplified. Dimensional standards may also be an indirect method of specifying quality 1/.

21. The most recent definitions of standards and standardization accepted by the International Organization for Standardization (ISO) are as follows:

(a) Standardization - Standardization is the process of formulating and applying rules for an orderly approach to a specific activity for the benefit and the co-operation of all concerned, and in particular for the promotion of optimum over-all economy taking due account of functional conditions and safety requirements; it is based on the consolidated results of science, technology and experience. It determines not only the basis for the present but also for future development, and it should keep pace with advances.

Some particular applications are:

(1) Units of Measurement;

(2) Terminology and symbolic representation;

(3) Products and processes (definition and selection of characteristics of products, testing and measuring methods, specification of characteristics of products for defining their quality, regulation of variety, interchangeability, etc.);

(4) Safety of persons and goods.

(b) Standard - A standard is the result of particular standardization effort, approved by a recognized authority. It deals with technical characteristics of product or of a method.

1/ The establishment of the Ceylon Bureau of Standards by A. Sundralingam, Director, Ceylon Institute of Scientific and Industrial Research, p. 3-4.

22. The kinds of standards in use could further be defined as follows in the interest of the clarity of this report:

Standard Specification

A specification is a written document in which one or more specific requirements that must be met are stated. For example, it can refer to material, dimensions, the final products, tool, etc. In English-speaking countries the words standard specification are often used instead of the word standard.

Company Standard

A company standard is a standard intended for use within a company. It can be a recommendation, or its use can be compulsory by a decision of the management.

Association or Trade Standard

This is a standard adopted by a group of related interests in a given industry or within a trade or profession.

National Standard

A national standard is a standard adopted by a national organization for standardization, which may be a governmental, a semi-governmental, or a non-governmental body. A national standard may either be a recommendation, or made compulsory through the enactment of laws.

International Standard

An international standard is a standard adopted by a recognized international organization, and intended for use internationally. So long as an international standard has not obtained an official national standard status or has not been made obligatory through international agreement it remains a recommendation.

Standard Code of Practice

A standard code of practice sets out recommendations of practice for design, construction, operation, safety, maintenance of a building, an installation, an equipment or a machine.

IV. SURVEY OF THE PRESENT SITUATION IN THE EAST AFRICAN SUB-REGION

23. In the East African sub-region only one standards institute has so far been established. This is the Standards Association of Central Africa in Salisbury, Rhodesia, which serves the standardization needs of Zambia, Malawi and Rhodesia. The Third Annual General Meeting of the Association on 18 September 1963 formulated the following objectives of the Association:

> "The main aim is to develop manufacturing industry to complement agricultural and mining production but, with protection, price and quality would have to be equated, and it is in this field that the Association's help would be sought. The Association could be of value to industrialists through the use of Association mark as a guarantee of quality; secondly, inspection schemes could be operated by the Association to check on and test the quality of purchases of nearly every commodity."

24. The Technical Committees of the Association cover the following fields of activities:

(a) Building and Civil Engineering;

(b) Electrical Engineering;

(c) Textile Industry;

(d) Miscellaneous Technical Committees.

25. The studies of the above Committees have resulted in the formulation of a series of 58 standards known as the "Central African Standards". These standards are, in many cases, based on the standards of the British Standards Institution; but are adopted after testing and making the necessary amendments. Testing has been intensified in such fields as metals, textiles, plastics, food stuffs, radiography, timber, etc.; however, in building and civil engineering it has decreased in both volume and importance.

26. The funds of the Association come from three sources. These are government grants, subscriptions by members (currently the enrolment is 250) and incomes from the activities of the Association (Advisory fees, work licenses, work inspection, testing, etc.).

27. The Governments of Malawi and Zambia participate actively in the work of the Association. Specialists and experts from both countries participate in the drawing up of standards, and standards agreed upon are applicable in all the countries of the former Federation. Grants are shared by all the three Governments.

28. In the remaining countries of the sub-region, the present situation as regards standardization efforts and existing research centres which could be developed into national standards institutes could be summarized as follows.

29. In Ethiopia, the only significant promoter of standardization appears to be the Ethio-Swedish Institute of Building Technology (ESIBT). It runs a Building Centre, which is the main and most active research station of building technology, building materials and structural problems. The ESIBT is a member of the International Council for Building Research and is consequently well informed about developments in the field of building and building materials industries. It could very well extend its activities in these fields to the benefit of the sub-region as a whole.

30. A proposal to establish a national standards institute is presently under consideration. Research facilities already exist at the Haile Sélassie I University. In the meantime, however, Ethiopia continues not to participate in the work and studies of the International Organization for Standardization (ISO).

31. Kenya has continued to use the standards of the British Standards Institution for all purposes without amendments. But the facilities exist to develop standardization in Kenya. Nairobi has already the technical and scientific centres which would prove helpful to undertake effective action for standardization. Laboratories such as those of the Roads Materials and Aerodrome Branch and of the Stores Division of the Ministry of Public Works have adequate equipment and staff. There is also the science centre of the University College of the East African University at Nairobi, which has considerable facilities for research in the fields of civil, mechanical and electrical engineering, chemistry, foundry, geology, and architecture. The basic material and personnel requirements, therefore, exist to work towards standardization.

32. In Tanzania, the basic centres which could help efforts at standardization are inadequate. There is, however, one office of measures and weights, but its activity appears to be limited to tests concerning the shape of packets. Otherwise, standards are in general not applied. There is no official attitude on the matter, and the testing of the quality of products is optional. All the same, studies which could prove helpful for standardization could be initiated by the physicists and mathematicians of the Dar-es-Salaam Branch of the East African University.

33. The standardization picture in Uganda is not dissimilar from that of Tanzania. The Makerere University could, however, act as a nucleus around which standardization action could be initiated, particularly in the field of agriculture in conjunction with the Department of Agriculture of the University.

34. A national standards institute is now under active consideration in Madagascar. Thus far, however, standards modelled along the lines of the French norms, are used in several technical fields, in particular in building and transport enterprises. In addition, a number of research and scientific centres are in operation in Madagascar specializing in a number of fields. Notable among these are:

Institut de Recherche Agronomique de Madagascar (IRAM) -- Agriculture,

Institut Malgache des Recherches Appliquées (IMRA) - Applied Research,

Centre Technique Forestier Tropical (CTFT) - Wood and Building,

Institut d'Elevage et de Médicine Vétérinaire (IFMVT) - Veterinary Science,

Laboratoire d'Analyse Minérale et d'Essais Industriels (AMEI) - Minerals and Industrial Testing

Centre d'Essai des Bâtiments et des Travaux-Publics (CEBTP) - Building and Civil Engineering Testing

Faculty of Science of the University

35. The above brief review of the present situation throws light on the low level of development of standardization in the sub-region. The total absence and/or inadequacy of national standards on the one hand

and the different systems of standards adopted from the industrialized countries have brought about a situation whereby sub-regional co-operation in industrial development, in expanding trade and in improving transport facilities faces practical and crucial problems.

36. The technical barriers among the countries of the sub-region manifest themselves in several areas.

37. With regard to measures and weights both the metric and the British systems are used. Table 1 below summarizes the system used in the various countries. Several of the countries using the British system are attempting to change over to the decimal system. The division of the shilling to equal 100 cents appears to embody a determination towards such a target.

TABLE 1

Metric and Foot System in East Sub-region

	Currency			Measures and Weights		
	Decimal	Pound	Mixed	Metric	Foot	Comments
Ethiopia	+					
Kenya	+				+	Envisaged the possibility
Tanzania	+				+	Envisaged the possibility
Uganda	+				+	Envisaged the possibility
Burundi	+				+	
Rwanda	+				+	
Rhodesia			+		+	
Zambia			+		+	
Malawi		+			+	In course of change into decimal
Somalia	+			+		
Madagascar	+			+		
Fr. Somali	+			+		
Mauritius	+				+	

38. The railways are based on at least two gauge systems. Table 2 shows the present differences among countries.

TABLE 2

Railways gauge in East Sub-region

	Gauge			
	Foot-inch		3'6"	
	Metric mm	1435	1067	1000	1000 (950)
Ethiopia				+	+
Kenya				+	
Tanzania				+	
Uganda				+	
Burundi					
Rwanda					
Rhodesia			+		
Zambia			+		
Malawi			+		
Somalia					
Madagascar				+	
French Somalia				+	
Mauritius				+	

39. Both right-side and left-side driving are prevalent in the countries of the sub-region. Ethiopia, Burundi and Rwanda, Somalia, Madagascar, and French Somalia use right-side driving and Kenya, Tanzania, Uganda, Rhodesia, Zambia, Malawi and Mauritius, left-side driving. Ethiopia was the only country which changed over to right-side driving from left-side driving in recent years.

40. In so far as testing of commodities are concerned, BS (British Standards) and NF (Norme française) are variously used depending on which standards were first introduced into the country. In a number of countries, testing of commodities is not undertaken, especially when the commodities are destined for home consumption. Rhodesia and Zambia are the only two countries in the sub-region which test qualities of domestically-produced goods and certify their quality.

41. Testing of export goods is in many countries left to the purchaser, who may or may not carry out the relevant tests - likewise, imported goods are also not generally tested. Testing is left to the discretion of the end-user, who may carry out testing based on the national standards of the exporting country, or as is more prevalent, the goods are not standardized.

V. SURVEY OF THE PRESENT SITUATION IN THE NORTH AFRICAN SUB-REGION 1/

Libya

42. The industrial development of Libya is still at the early stages; only a few branches of industry have been established, namely:

- food products (processing industries)
- building materials
- soap and detergents
- tobacco
- matches and plastics.

As a result of the Five-Year Industrialization Plan it might be expected that the pace of industrialization will increase.

43. The Libyan industries do not apply any standards developed locally. Imported industrial products are sometimes produced according to the standards of the exporting countries, and in this way standardization is applied.

44. However, the policy of the Libyan Ministry of Industry is to encourage standardization as much as possible. The country is ready to collaborate with the other Maghreb countries (Morocco, Algeria, Tunisia) and other Arab countries, and to join an all-African organization for standardization.

45. There is a shortage of qualified personnel, and there is as yet no programme on standardization. The following institutes would provide a nucleus:

(a) National Research Laboratory;
(b) Testing Laboratory;
(c) Polytechnical School.

The team recommends that the Industrial Research and Study Centre for the Maghreb area, a Special Fund project under negotiation, should include in its programme of work a study on standards which would be appropriate for the sub-region and other countries of Africa.

1/ It was not possible to visit the Sudan.

Morocco

46. The need for standards in terminology, dimensions and quality led to the establishment of SNIMA in 1962. SNIMA (Service de Normalisation Industrielle Marocaine) co-ordinated the standardization activities in the public and private sectors; and together with OCE (Office Chérifien d'Exportation) examines and identifies products to be standardized.

47. SNIMA has no staff. The work is done by officials of the Ministry of Commerce and Industry and by technical committees. The committees consist of 4-16 members, some of whom are technicians in various industries.

48. The following technical committees have been established:

x 0 - Generalities
1 - Agriculture, Fishing, Forestry
2 - Sugar, Coffee
x 3 - Preserves
x 4 - Grease, Milk
5 - Grease and meal
6 - Beverages, Tobacco
x 7 - Energy
x 8 - Phosphates
x 9 - Mining
x 10 - Building materials
x 11 - Official Buildings
x 12 - Packing
x 13 - Iron and steel industry, Metallurgy
x 14 - Metals, equipment
15 - Cars, Aircraft, Bicycles
x 16 - Metals, Consumption goods
17 - Machine parts
x 18 - Textiles, Ready-made clothing
19 - Textiles, Spinning and Weaving
x 20 - Leather
21 - Shoes (boxes)
x 22 - Chemical industry

x 23 - Plastics
x 24 - Rubber
x 25 - Paper, Cardboard
26 - Wood (miscellaneous)
27 - Ceramics, Glassware
28 - Transport
29 - Services (Banks, Post, Medical)
30 - Dwellings
31 - Trade
32 - Administration
x 33 - Miscellaneous other than 26 (Security)

X - These committees are active.

Over 100 draft standards are being studied by the committees. The draft standards are published every three months.

49. Collaboration with the countries of the Maghreb is envisaged. Priority is, however, given to standards for national production. The standards selected are usually those recommended by ISO or IEC; American, European and sometimes Asian standards are also used. Once standards have been adopted, their observance is ensured by the joint action of the Government and industry.

50. There are 24 definite Moroccan standards of which:
6 are in the field of terminology,
10 are in the field of testing,
6 are in the field of dimensions,
1 is in the field of bio-chemical analysis,
1 is miscellaneous.

Pending legislation on standardization, the standards are sold free of charge.

Algeria

51. As of now no standards body exists in Algeria, nor are there any ministerial departments dealing with standardization. The officials in Algeria, however, fully appreciate the need for a standardization organization in order to improve the quality of industrial materials, and

prevent the production of goods of inferior quality and undesirable dimensions. An Algerian standardization body co-operating in a Maghreb standardization association is considered desirable.

52. With a view to the establishment of an Algerian standardization organization, a report has been drawn up concerning standardization in Algeria and special attention is paid to the necessity of co-operation on an all-African level.

53. Algerian industry is now applying AFNOR standards, which are not compulsory but optional. The Ministries which are interested in standardization are considering the submission of a request to the United Nations for an expert on standardization to advise on the establishment of an Algerian standardization body.

Tunisia

54. In Tunisia, as in Algeria, there is no standards organization. The AFNOR standards are used. However, plans are underway for the introduction of local standards. The United Nations has been requested to assist.

United Arab Republic

55. In the UAR, a standardization organization (EOS) has been in existence for some time.

56. Until 1956, the field of standards and specifications remained open for all ministries, scientific societies, institutes, laboratories and enterprises. Accordingly, different and variable standards for the same articles and products existed. Most of them were based on the standards of foreign countries.

57. The first steps towards unification of Egyptian standards were made by the Engineers Society in 1939, but owing to the Second World War, it was delayed until 1947, when the activity of the society in this field increased and accordingly some technical committees were formed to unify the standards of building materials, metallic constructions, chemical products, and some other specifications as drawings, symbols and technical definitions.

58. In the field of metrology, there were also different activities taken by various ministries, technical departments and institutes concerning the verification of weights and measures and the calibration of different electrical and mechanical appliances and measuring instruments.

59. The efforts for the application of the metric system began in 1885. Many unsuccessful trials were made until 1951 when the decree 229-1951 was issued considering the metric system to be the only system in the country and giving a transition period of 5 years for its obligatory application. But owing to various difficulties, another decree was issued in January 1957 according to which the transition period was doubled and the date of 15 November 1961 was fixed for abolishing all the other measuring systems applied in the country.

60. When the Ministry of Industry was organized in the year 1956, it was taken into consideration that the Department of Industrial Planning would have a technical section for elaborating specifications for local new materials and products, and for organizing the system of verification and calibration of measuring instruments used in industrial production.

61. Then, taking into consideration the importance of standardization as a fundamental basis for industrialization, it was decided to establish an independent authorised national organization for standardization and the law No. 2-1957 for standardization, and the Presidential order No. 29-1957 for establishing the Egyptian Organization for Standardization were issued considering the specification and calibration section in the Industrial Planning Department as a technical and administrative Secretariat for the newly-formed Organization, and authorizing the EOS to carry on the following tasks:

(1) Elaborating standard specifications for materials and products of all industries;

(2) Securing reference standards for calibration and verification of measures and measuring instruments;

(3) Ensuring the existence of standard systems for technical classifications, terms and symbols;

(4) Making the necessary measures for quality control of raw materials and products, in conformity with the standard specifications and establishing a central laboratory for metrology and quality control;

(5) Co-ordinating the standardization work in the Republic in accordance with other international standardization work.

62. Accordingly, it is now forbidden to any other department, general or private organization to elaborate standards. If any organization wishes to elaborate a standard for industrial raw materials or products, it should apply to the EOS giving its reasons and requirements, and thus no specification in the Republic is considered as a standard except after approval and registration by the EOS.

Organization of EOS

63. EOS started its work by the middle of the year 1957. It has the following committees:

64. A Council, headed by the Under-Secretary of Industry, of 15 members representing the different technical, industrial and standardization sectors in the country.

65. A Permanent Committee for Standards Specification, of 12 members to deal with all the work related to standard specifications and quality control. This Permanent Committee is managing the work of Technical Standing Committees for the different technical fields (Textiles, Food, Electrotechnical and Metallic Engineering, Chemical products, etc.). The Technical Standing Committees have working groups, the members of which are technical experts of the parties concerned. A staff member of EOS acts as secretary.

66. A Permanent Committee for Metrology and Calibration, of 12 members, to deal with all the work related to metrology, calibration and verification of measures and measuring instruments.

67. A technical and administrative secretariat, consisting of the staff of the following Departments:

(1) Standard Specifications

(2) Quality Control

(3) Metrology and Calibration

(4) Technical Relations

(5) Finance and Administration.

68. EOS is a member of:

(a) International Organization for Standardization (ISO)

(b) International Electrotechnical Commission (IEC)

(c) International Organization for Weights and Measures (Paris)

(d) International Organization for Legal Metrology (Paris)

(e) American Society for Testing Materials (ASTM).

69. The programme for standardization is based on priorities and covers all industries concerning the following:

(a) Newly-produced articles

(b) Export articles and materials

(c) Requirements of governmental concern and armed forces

(d) Consumer goods.

70. The programme for metrology work consists of three phases which are now executed side by side:

(a) The first phase consists in organizing systematic and periodical verification and calibration, depending on the already existing facilities in the country (Institutes, Universities, Laboratories and Technical Departments).

(b) The second phase comprises the training of different laboratories of scientists and technicians necessary for verification and metrology work.

(c) The third phase deals with establishing the control laboratories for standardization consisting of:

i. National Physical Laboratory

ii. Control Laboratory for Metrology and Material testing

iii. District Laboratories and Offices.

Development of a standard

71. A request for standardization of a technical subject (product or method) is submitted to the Council, which decides whether the request will be accepted or not within the adopted standardization programme.

72. In case of acceptance, the request is submitted to the Permanent Committee for approval.

73. Before a working group starts its technical work, the staff of EOS holds an economic and technical investigation in order to define the importance and scope of the subject.

74. This inquiry includes among other things:

(a) How many industries are producing the goods or materials.

(b) The organization of the production

(c) Possibilities for export

(d) Industrial needs and development

(e) Governmental needs

(f) Which foreign standards are in use (DIN, AFMOR, BSI, etc.)

(g) Study and comparison of foreign standards related to the item.

75. EOS takes as much as possible advantage of international and foreign standards. If no foreign standards are applicable to the local needs, EOS has to establish standards of its own.

76. The secretary passes his report to the Standing Committee, which takes a decision concerning the priority of the subject.

77. Priority is given to subjects which save imports and promote home production in order to use the foreign currency for the purchase of

machines and materials which are not produced in the country and in order to enlarge employment. In the month of May a priority programme is drafted for all standardization work, the execution of which starts in September.

78. The preparation of a draft standard takes about 6 months. After a draft standard is accepted by the Standing Committee, it is submitted for approval or circulation for comments to the concerned Permanent Committee.

79. A draft standard, approved by the Permanent Committee is published for comments and forwarded to all parties concerned (industries, organizations, institutes, laboratories, departments etc.).

80. As a rule a draft standard specification is published for comments during one month but it is possible to extend this term to three months. At the end of this term the working groups work up the comments and the final draft is presented to the Standing Committee, the Permanent Committee and the Council.

81. After adoption by the Council the relevant technical department of EOS projects the lay-out and takes care of the printing and distribution (2,000 copies).

82. Each EOS-Standards mentions the following:

(a) a title
(b) a number and date of issue
(c) a UDC-number
(d) a reference to foreign standards which have been consulted or translated
(e) a reference to ISO, IEC or ASTM standards on which an EOS standard is based
(f) the co-operating organizations
(g) in case of research the results of this research
(h) methods of sampling.

83. The EOS standards are partly compulsory and partly optional standards. By a ministerial order the standards may be transferred in compulsory standards. This occurs when the standard covers the following:

- Security
- Quality (consumer's protection)
- Governmental needs
- Industrial development

During the publication of the draft standard, attention is paid to the fact that the standard will be transferred into a compulsory standard.

EOS mark

84. The leading principle for production in conformity with standards is that the new industries get more experience and that it protects the consumers. When goods or materials meet the standardized requirements, the EOS mark may be put on it. But before EOS authorizes the manufacturer, the products are controlled in laboratories indicated by EOS and afterwards by EOS inspectors in the factories.

85. For products produced in conformity with compulsory standards, the EOS mark is obligatory. Manufacturers of products in conformity with optional standards can be licensed by EOS to put the EOS mark on their goods. For this purpose they have to lay a request before EOS. Over more than 100 requests have been received by EOS within less than 2 months.

86. In order to keep the standards in conformity with the technical requirements of the developing industry, each standard is revised after 2 years. Industry in the UAR is developing very fast. Within 9 years, 760 new factories were set in production.

87. These industries cover the following fields:

	Factories
Petroleum industries	5
Mining industries	7
Metallic industries	11
Mechanic industries	204
Textile industries	196
Chemical industries	155
Food industries	140
Miscellaneous	41

88. The library of EOS contains the following:

(a) Standards and catalogues of the National Standards Bodies, members of ISO

(b) ASTM standards

(c) ISO recommendations and IEC publications

(d) Books, periodicals and other documentation concerning standardization

(e) Full documentation on the technical commissions of ISO, on the work of which EOS is a P(articipating)-Member or an O(bserver)-Member.

Participation Table in ISO Technical Committees

89.

ISO/TC	1	Screw threads	P
	2	Bolts, nuts and accessories	P
	3	Limits and fits	O
	5	Pipes and fittings	O
	6	Paper	P
	10	Drawings	O
	12	Quantities, units etc.	P
	17	Steel	P
	19	Preferred numbers	O
	22	Automobiles	O
	23	Agricultural machines	O
	25	Cast iron	P
	26	Copper and copper alloys	O
	27	Solid mineral fuels	P
	28	Petroleum products	P
	29	Small tools	O
	33	Refractories	P
	34	Agricultural food products	P
	35	Paints, varnishes etc.	P
	37	Terminology	O
	38	Textiles	P

ISO/TC	39	Machine tools	O
	44	Welding	O
	45	Rubber	P
	46	Documentation	O
	47	Chemistry	P
	48	Laboratory glassware	P
	51	Pallets	O
	52	Metal food containers	O
	54	Essential oils	O
	57	Surface finish	O
	58	Gas cylinders	O
	59	Building construction	O
	61	Plastics	O
	65	Manganese ores	P
	67	Materials and equipment for Petroleum industry	O
	68	Banking	O
	69	Statistics	O
	70	Definitions relating to machines	O
	72	Concrete	O
	72	Textile machinery	O
	73	Marks indicating conformity with standards	P
	77	Transfusion equipment for medical use	O
	78	Aromatic hydrocarbons	O
	79	Light metals and their alloys	P
	80	Safety colours	O
	82	Mining	O
	84	Syringes and needles for medical use	O
	85	Nuclear energy	O

ISO/TC	86	Refrigeration	O
	91	Surface active agents	O
	92	Fire tests on buildings etc.	O
	100	Chains and chain wheels for power transmission	O
	102	Iron ores	P
	108	Mechanical shock and vibration	O
	114	Horology	O
	116	Performance testing of space heating appliances	O

VI. TECHNICAL, INDUSTRIAL AND ORGANIZATION MATTERS OF THE PRESENT STANDARDIZATION IN CENTRAL SUB-REGION OF AFRICA

Congo - Leopoldville

90. In Congo - Leopoldville there is no official Standards organization, but there are several private Associations which carry out the appropriate studies and issue their own "conditions". These centres do not wish to establish a governmental organization on standardization.

91. There is a number of Associations which are co-ordinated through the "Fédération des Associations d'Entreprises du Congo" (F.E.C.). This Federation consists of the following:

Association des Entreprises de l'Equateur "ADEQUA"
Association des Entreprises de l'Est du Congo "A.E.E.C."
Association des Entreprises de Kasai "A.E.KAS."
Association des Entreprises de Katanga "ASSEKAT"
Association des Entreprises de l'Ouest du Congo "A.E.O.C."
Association des Entreprises des Produces Orientales "AEPO"

These local Associations might serve as a base for standardization in Congo.

92. The most important of the Congo Associations is the "Société Congolaise de Surveillance" comprising 80 per cent of the production of the Congo and has the largest connexions with the other countries and organizations, for instance, the Common Market in Europe. The "Société Congolaise" is mainly active in mining, industry and agriculture. Standards procedures are issued by the "Chambre de Commerce et d'Industrie de Léopoldville". These are referred to as "Conditions Générales" and "Conditions particulières du contrat Léopoldville" and as they contain all the technical specifications and testing as well as conditions for contracts they constitute the basis of future standardization in the Congo. The scope of these "Conditions" concerns more agricultural products of the Congo. The other products, mainly mining products and raw materials, are produced under specified "conditions", but these are confidential.

93. There are also suitable laboratories for testing. With regard to scientific centres, there are in Léopoldville the following High Schools:

l'Université LOVANIUM

l'Institut National du Bâtiment et des Travaux Publics

and an institute acting as the evening school, viz.:

l'Institut Polytechnique Congolais.

94. From the standardization point of view, the most important is the University "LOVANIUM" which has three relevant faculties:

(a) Faculté des Sciences comprising:

Mathématiques

Physique

Chimie

Biologie

Géologie

Minéralogie

(b) Faculté d'Agronomie

(c) Faculté Polytechnique comprising:

Civil engineering

Electrical engineering

Mechanical engineering

Construction.

95. The "Ecole Nationale de Droit et d'Administration" also provides suitable education on planning. Leopoldville could become a good centre for standardization in the sub-region.

Gabon

96. Gabon has rich mineral resources, e.g. manganese, uranium, petroleum, gold and iron ore. Unfortunately, production is not based on standards.

97. There are no institutes or research centres, except the "Office de la Recherche Scientifique et Technique" Centre de Libreville. The small number of qualified specialists in the field of technical testing is a serious handicap.

98. An institute for research and testing which might serve all countries in the Central African sub-region or even all French-speaking African countries, is to be established.

99. The first railway in Gabon is projected from the seaside to the iron ore centre - the gauge of the railway is based on the normal gauge 1435 mm. However, this matter is still under consideration. Roads are classified from three standpoints:

(a) Technical: Bitumen road - 84 km.
Cement road - 1,490 km.
Soil road - 3,070 km.
Various roads - 1,200 km.

(b) Administrative

(c) Width of roads - on the basis of the International Road Classification

100. Generally speaking, all rules or specifications, if they are to be applied, are based on the French standardization. The decimal system of measures and weights is compulsory. There also exists the Office of Measures and Weights. An interesting development is the creation of one customs area for all five countries in the sub-region (excluding Congo Leopoldville). This agreement (TRAITE) was reached in 1964. It will operate from the beginning of 1966.

Cameroon

101. There is no standards body in Cameroon. The industrial enterprises apply standards of foreign countries which supply the Cameroonian industry with materials, machines and tools.

102. As many industries buy their equipment from several western countries, one system of standards for the western world would prove to be of great importance for industry in the Cameroon.

103. For trade in agricultural products the relevant international standards are applied. Only products which come up to these standards can be exported. The most important agricultural products are sugar, cacao, coffee, cotton, citrus fruits and palm kernels.

104. The following institutes for testing agricultural products exist:

IFCE: Institut français de Café et Cacao

IRCT: Institut de recherches sur les coton et les textiles

IFAC: Institut de Fruits et Agrumes tropicaux

IRAT: Institut de Recherche Agronomic Tropical.

105. The main industrial branches are:

Aluminium, compressed gas, tobacco, shoeware, beverages, bakery products, cocoa products, ready-made clothing, electricity, printing offices, bicycles, furniture, plastics, chemicals, mechanical constructions.

New industries will be established shortly in the following branches:

Metal works, matches, textiles, cement, bricks, sugar refinery, chemical works, enamels, assembling plant for cars.

106. Though the Cameroonian Government and industry are not yet in need of standards of their own, they are ready to apply Cameroonian standards when they are issued by a Cameroonian standards body. They are also willing to co-operate in a sub-regional organization, especially with regard to customs regulations. The metric system will be applied in future for the whole country. No qualified staff is available.

VII. SURVEY OF THE PRESENT SITUATION IN THE WEST AFRICAN SUB-REGION

107. The dominating impression gained from discussions in West Africa 1/ is the need for standardization in a variety of fields, and that there is an awareness of the advantages that organized African standardization would bring in many cases. The concept of a central African standardization organization with a network of local contracts or organs is clearly understood. It therefore seems that the situation in West Africa is ripe for action.

108. French-speaking countries use French standards to a wide extent, while English-speaking countries use British standards, but other standards are found, including - especially in Liberia - American standards. The standards of different industrialized countries are often applied in West Africa. This is obviously due to the fact that all the countries depend on overseas industrialized countries for industrial equipment.

109. In many cases, internationally-recognized trade standards are applied, for example, the International Standards of Quality and Packing for Natural Rubber Grades, published by the Rubber Manufacturers, Inc. of the United States.

110. In view of the great importance of agricultural exports for the majority of African States, the control of the quality of these products is of great importance. In fact, inspection and control of exports are apparent everywhere in West Africa. The standards used are the former French or English national standards, decrees and orders.

111. The introduction of the metric system throughout Africa is one of the most important tasks for an African standardization organization. This view has also been expressed in Liberia and Nigeria, which now use British measures.

1/ Within the time available only the following countries were visited: Guinea, Ivory Coast, Liberia, Niger, Senegal.

112. A committee for standardization has been active in Guinea, but is now defunct. An Office for Standardization and Weights and Measures has been proposed recently, its duties will be: 1/

"(1) To standardize the quality of products of a similar nature of accepted technical type, i.e. not protected by letters of patent.

(2) Simplify and reduce the number of grades of a single product, with due regard to the needs of consumers.

(3) Formulate and impose standard test methods whereby the conformity of supplied products to the adopted standards of quality can be ascertained.

(4) Formulate and impose in the technical fields of assembly and construction rules of design, erection and uniform work procedures assuring the uniform quality of constructions."

113. The most urgent task is stated to be: "To examine the question of rules, design rules and procedures primarily in the field of building and public works, and secondly in ship construction and aviation." Standards for public works have been prepared, but these require amendments and improvements. An engineering expert is required to advise on this problem.

Research Institutes and Testing Laboratories

114. The team gave special attention to research institutes and testing laboratories, which in many cases will assume great importance in the development of African standards.

1/ A. Boisrayon, Premier rapport introductif sur le problème de la normalisation, Conakry, December 1963.

115. Ghana 1/

"Building Research Institute"

The activities of the Institute include:

(a) Investigation into the nature and behaviour of materials

(b) Development of indigeneous materials and techniques

(c) Application of existing knowledge to all aspects of the building industry

(d) The exchange and dissemination of knowledge

(e) Technical apprenticeship and training in industrial research.

Food Processing and Research Centre: "The main objects are the processing of food products and the operation of pilot plants as demonstration and training units. They also include food standards and testing and research into local food products."

116. Guinea

Conakry Polytechnic College has well-equipped labs for the following disciplines: basic science, agronomy, civil engineering, geology and mining, electrical engineering. It has a large potential for research and testing in the service of industry and trade.

There are several labs under the Ministry of Economic Development, which are concerned with mine and metallurgical products.

Pharmaguinée Laboratory - pharmaceutical products

Pastoria Kindia - products for vaccination purposes

Fruit Research Centre Foulaya - fruit-farm products

117. Ivory Coast

Laboratories for building and public works

Ivory Coast Mining Development Association has a particularly well-equipped laboratory whose resources would suffice very well for the needs of the mechanical engineering industry. This institute also serves Dahomey, Niger and Togo.

1/ A Report on Institutes of Industrial Development and Research on Sub-regional Basis for Africa (E/CN.14/INR/41), p. 26.

Ivory Coast Technical Centre of Tropical Forestry is devoted to technology, the use and preservation of wood.

French Overseas Fruit Research Insitute is in principle a research institute (parasite control, etc.) but carries out tests of quality and packing of products especially for the control and protection of exports. At present efforts are being made to establish standards for the quality and packing of avocados.

Fishing Service - engaged on standards for fishing-boat design and equipment, etc.

Ivory Coast Laboratory for Chemistry, Toxicology and Adulterations

Research Institute for Cotton and Foreign Textiles, Bouake

Zootechnic Research Centre, Bouake

118. Liberia

University of Liberia, Science Division, has certain facilities which could serve industry, and requests have been received from a few industrialists for testing and analysis.

Laboratories of Firestone Tire and Rubber Co. Robertsfield

National Public Health Central Laboratory - carries out food-product tests.

119. Niger

Solar Energy Centre (being erected)

Geological and Mining Research Offices

Technical Centre of Tropical Forestry (being established)

Research Institute for Tropical Agronomy and Food Production

Livestock Laboratory (being established)

120. Nigeria [1]

Federal Institute of Industrial Research, Oshodi

The Institute has good facilities and can be expanded and strengthened. Under an autonomous Board, this Institute could function more efficiently

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1/ A Report on Institutes of Industrial Development and Research on Sub-regional Basis for Africa (E/CN.14/INR/41), p. 24.

than it does at present. Research work carried out includes:

(a) Gari processing from cassava;

(b) Pulp and paper-making characteristics of four varieties of Nigerian timber;

(c) Protein fortification of starchy foodstuffs;

(d) The occurrence and utilization of plant gums.

Hides and Skins Demonstration and Training Centre

Its purpose is to provide demonstration, training and research in order to improve the quality of hides and skins and to develop industrial methods of leather processing and manufacture.

121. Senegal

Soil Research Centre (ORSTOM), Dakar-Hann

Geophysical Centre (ORSTOM), M'Bour

Adulteration Control Laboratory

University of Dakar, Faculty of Sciences

Polytechnic College (envisaged)

Food Technology Institute - interests include standards for food products

African Food and Nutritional Research Organization - basic research and industrial technology

Institute for Research in Tropical Agronomy

Zootechnic Service

122. Institut français du Café, du Cacao et autres Plantes stimulantes (IFCC)

Objects:

To undertake all kinds of studies, research, surveys and investigations relating to coffee, cocoa and tea plants and other stimulant crops, with a view to improving cultivation and production, as well as the processes of treatment and conversion of the products. It has four branches in the Ivory Coast.

123. Institut français de Recherches fruitières outre-mer (IFAC)

Objects:

Studies and research relating to the improvement and development of the cultivation of fruits and of overseas processing industries. It has two laboratories or experimental stations in the Ivory Coast.

124. Office de Recherche scientifique et technique outre-mer (ORSTOM)

Objects:

To undertake and develop in non-temperate regions fundamental research aimed at plant and livestock production and also at the determination of the basic features of the natural and human environment.

To establish and develop in the said regions an infrastructure permitting fundamental research in all fields.

To assist in the establishment of a corps of scientific and technical research specialists in non-temperate regions.

Centres and stations:

Ivory Coast	1
Senegal	2
Togo	1

Missions:

Dahomey, Upper Volta, Niger

French Research Organizations active in West Sub-region of Africa

125. Institut de Recherches pour les Huiles et Oleagineux (IRHO)

Objects:

To undertake all kinds of studies, research and experiments concerning tropical oil seeds with a view to improving cultivation and farming, as well as the processes of extraction, preparation and conversion of the oil.

126. Institut de Recherches sur le Caoutchouc en Afrique (IRCA)

Objects:

The introduction and extension of the cultivation of the para-rubber plant in Africa.

127. Institut de Recherches du Coton et des Textiles exotiques (IRCT)

Objects:

The development of production of vegetable fibres through the parallel improvement of cultivation techniques, vegetable raw materials, and the methods of fibre extraction in sub-tropical, tropical or equatorial regions of the world.

Experimental stations and centres:

Mali	2
Upper Volta	1
Ivory Coast	1
Togo	1
Dahomey	1

128. Centre technique forestier tropical (CTFT)

Objects:

To carry out all kinds of applied research, studies and work control concerned with waterways and forests of the tropical and sub-tropical regions. There is a branch in the Ivory Coast.

VIII. CONCLUDING NOTE

129. It was not possible for the team, within the time available, to formulate concrete recommendations concerning regional, sub-regional and national institutions. Further studies and consultations would be necessary before agreement is reached on appropriate institutes of standards.

130. The team agreed, however, to recommend to all African countries, consideration of regional and sub-regional standards institutes or associations, the main function of which would be to co-ordinate the work of existing and planned national standards bodies, in close co-operation with research institutes already in existence in several African countries.

131. On the basis of the information gathered, it would seem that national standards bodies are required. The normal procedure is to form expert committees with representatives from producers, consumers and technologists, to prepare draft standards on the basis of common agreement. It might also be necessary to set up, in most countries, laboratories for testing.

132. The team recommends that further detailed studies should be undertaken as a continuation of this preliminary survey.

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